

metrid caterpillars associated with avocado foliage in southern California frequently exhibit "mixed" parasitism from both braconids (*Apanteles*) and chalcids (*Meteorus*) (Oatman et al., 1983, op. cit.). Young and Muysmond (op. cit.) suggest that tachinids associated with *Opsiphanes* populations in Central America are most likely generalists on a broad range of lepidopterous hosts. Whether or not hymenopterous and dipterous parasitoids converging ecologically on the same individual host caterpillar actually engage in competition for the host remains to be studied quantitatively. And the *Opsiphanes* × Musaceae and Palmae interaction in Central America might be a good model system for such studies, given (1) the large body-size of the host caterpillars, (2) the exploitation of the caterpillars by braconids, chalcids, and tachinids (including the same individual host), (3) the relatively restricted monocot food plant association of the caterpillars, and (4) the apparent economic importance of some *Opsiphanes* (e.g., Harrison, op. cit.).

Other brassolids associated with Palmae in Central American forests may not be experiencing the same forms of selection pressure from parasitoids as *Opsiphanes*. Commonly nesting aggregations of the caterpillars of *Brassolis isthmia* (Bates), which construct leaf and silken nests from adjacent palm leaf pinnae and which exhibit a strongly crepuscular feeding activity outside the nest, do not, for example, experience attacks from parasitoids such as Tachinidae and Chalcidae (A. M. Young, unpubl. observ. and field data).

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#### ON A PREVIOUS REPORT OF DIURNAL ROOSTING OF THE PIPEVINE SWALLOWTAIL, *BATTUS PHILENOR* (L.)

Gillaspay and Lara (1984, *J. Lepid. Soc.* 38:142-143) recently recounted their observations concerning a short-lived aggregation of *Battus philenor* (L.) in apparent response to an approaching rainstorm. They reported six butterflies flew to a branch of a mesquite, *Prosopis glandulosa* Torr., on 12 June 1981 near Laredo, Texas. Gillaspay and Lara (op. cit.) wondered if these butterflies would later return for a nocturnal roost, but they were unable to provide further observations. They also suggest that further, admittedly fortuitous, observations would be required to understand fully such temporary behavior.

Interestingly, observations by H. B. Parks (1935, *Bull. Brooklyn Entomol. Soc.* 30:196) on a similar occurrence provided some answers to questions raised by Gillaspay and Lara (op. cit.). On 7 June 1935, near Santa Rita in southern Brooks Co. (approximately 150 km southeast of Laredo), he observed 40 *B. philenor* (prior to commencement of rain) fly toward and hang underneath the limbs of a huisache, *Acacia smallii* Isely, with, "The thick leaves and branches thus giving complete protection." Of particular significance to one query presented by Gillaspay and Lara (op. cit.) is the report of a "Ranchman [who] stated that these butterflies came to this one tree . . . also to roost during the night."

Field workers in the southern Texas area should be aware of the need for observations on these nocturnal roosts, if they exist. Obviously, each butterfly rests at night at some

location. The significant question is whether these butterflies rest individually or clumped in aggregations.

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### NATURAL HISTORY NOTES FOR SOME *HAMADRYAS* BUTTERFLIES (NYMPHALIDAE: NYMPHALINAE; AGERONINI) IN NORTHWESTERN COSTA RICA DURING THE TROPICAL DRY SEASON

The relatively small cluster of species belonging to the nymphaline genus *Hamadryas* are well known as "calicoes" or "crackers" in the adult stage throughout much of Central America, Mexico, and South America. The medium-sized gray-and-white speckled butterflies are pugnacious, fast-flying insects that commonly perch on the trunks of trees during the daytime, head downwards, and with the wings held pressed down in the open position. Their fast aerial antics coupled with loud clicking noises evident in both sexes, and often involving attack approaches to "intruders" into their areas, have made them the subject of behavioral studies (e.g., Ross, 1963, *J. Res. Lepid.* 2:241-246). As a group, the caterpillars feed on Euphorbiaceae, particularly vines and shrubby plants of the genus *Dalechampia* (e.g., Young, 1974, *Z. Angew. Entomol.* 76:380-393; Muysshondt & Muysshondt, Jr., 1975a, *J. New York Entomol. Soc.* 83:157-169; 1975b, *J. New York Entomol. Soc.* 83:170-180; 1975c, *J. New York Entomol. Soc.* 83:181-191; Jenkins, 1983, *Bull. Allyn Mus.* 81:1-146) and may function as significant selective agents in the evolution of herbivore resistance in these plants (Armbruster, 1982, *Amer. J. Bot.* 69:1429-1440). Adult butterflies are typically associated with open pastures and borders of dense vegetation (Ross, 1964, *J. Res. Lepid.* 18:11-26; 1967, *J. Res. Lepid.* 18:11-26; 1967, *J. Res. Lepid.* 15:109-128; Monroe et al., 1967, *J. Lepid. Soc.* 21:185-197). Because some species of *Hamadryas* occur in the seasonal tropical dry forest zones of Central America, they offer the chance to study the impact of tropical seasonality upon their natural history. In this note we report such preliminary field studies from the lowland tropical dry forest zone of northwestern Costa Rica as performed during the dry season. Herein, we describe some hitherto unreported features of adult behavior, including nocturnal perching relative to daytime perching, and evidence that, although females are mated during this period, they appear to be in a state of reproductive diapause.

From 2-4 March 1984 we studied and collected adult *Hamadryas* from these two localities: (a) about 1.5 km south of Liberia (10°40'N, 85°40'W), Guanacaste Province and along the Pan American Highway, and (b) "Barranca Site" (Orians, 1969, *Ecology* 50:783-801) about 6 km from Miramar (10°06'N, 84°44'W), Puntarenas Province. Both localities fall within the region of lowland tropical dry forest and experience a completely dry (no rainfall) season generally between December and May each year. Within a wide rectangular roadside area (approx. 50 m × 100 m) at the Liberia site, we studied the abundance and habits of adult *Hamadryas* on several mature forest canopy trees, mostly *Guazuma ulmifolia* Lam (Sterculiaceae). Approximately 75% of this area was covered by a dense patch of disturbed forest, consisting chiefly of a *Guazuma* "canopy" and fairly evergreen understorey consisting of various Leguminosae, Flacourtiaceae, and other small trees and shrubs in varying degrees of "leafing out" at the time. We examined the distribution of adult *Hamadryas* perching on tree trunks within the forest patch and along its borders at various times of the day and night. As it was quickly apparent that the butterflies were most numerous along the strip of shade trees between the forest patch and the highway (Fig. 1), we concentrated our observations to that area which